AEROSPACE MATERIAL SPECIFICATION

AMS3377	REV. A

Issued 1993-10
Reaffirmed 2000-08
Stabilized 2015-03

Superseding AMS3377

Sealing Compound, Electrically Conductive Corrosion Inhibiting

RATIONALE

This specification does not have any qualified products. It is not being actively used. The Committee had a discussion at the October G-9 meeting to stabilize this specification which is reflected in the minutes.

STABILIZED NOTICE

This document has been declared "Stabilized" by the SAE AMS G9 Aerospace Sealing Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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1. SCOPE:

1.1 Form:

This specification covers a synthetic rubber sealing compound which is electrically conductive when used in a faying surface, contains corrosion inhibitors, and supplied as a two-component system which cures at room temperature, suitable for application by extrusion gun or spatula.

1.2 Application:

This product has been used typically for faying surface sealing and wet-installation of fasteners in aircraft structural joints where electrical conductivity is required, but usage is not limited to such applications. The sealing compound is usable from -65 to 200 °F (-54 to 93 °C).

1.3 Classification:

Sealing compound is classified on the basis of application time as follows:

Type 1 - 30 minute application time
Type 2 - 2 hour application time

1.3.1 Unless a specific type is ordered, either type may be supplied.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

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2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2471	Anodic Treatment of Aluminum Alloys, Sulfuric Acid Process, Undyed Coating
AMS 2629	Fluid, Jet Reference
AMS 3819	Cloths, Cleaning, for Aircraft Primary and Secondary Structural Surfaces
AMS 4037	Aluminum Alloy Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn (2024;-T3 Flat Sheet, T-351 Plate), Solution Heat Treated
AMS 4049	Aluminum Alloy Sheet and Plate, Alclad, 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr, (Alclad 7075; -T6 Sheet, - T651 Plate), Solution and Precipitation Heat Treated

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM D 412	Rubber Properties in Tension
ASTM D 792	Specific Gravity (Relative Density) and Density of Plastics by Displacement
ASTM D 2240	Rubber Property - Durometer Hardness

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

PPP-B-636	Box, Shipping, Fiberboard
PPP-C-96	Can, Metal, 28 Gage and Lighter
MIL-C-38736	Compound, Solvent, for Use in Integral Fuel Tanks
MIL-STD-2073-1	DOD Materiel, Procedures for Development and Application of Packaging Requirements
MS 21042	Nut, Self Locking, 450 Dea F, Reduced Hexagon, Reduced Height, Ring Base, Non Corrosion Resistant Steel
NAS 603	Screw, Machine, Aircraft, Pan Head, Phillips Recess, Full Thread, Alloy Steel

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3. TECHNICAL REQUIREMENTS:

3.1 Materials:

The basic ingredient shall be polysulfide type synthetic rubber with added available chromate for corrosion inhibition. Compound shall also contain 0.9 to 2.5% by weight deoxidized aluminum particles which are 50 to 200 mesh in size. Compound shall cure by addition of a curing agent to the base compound, and shall not depend on solvent evaporation for curing. The curing agent shall possess sufficient color contrast to the base compound to permit easy identification of an unmixed or incompletely mixed sealing compound. Neither the base compound nor cured sealant shall be red or pink in color.

3.2 Properties:

Compound shall conform to the requirements shown in Table 1, determined in accordance with test methods specified in 4.5:

TABLE 1 - Properties

Paragraph	Property	Reqirement	Test Method
3.2.1	Specific Gravity, maximum	1.65	ASTM D 792, Method A-1
3.2.2	Hardness, Shore A Durometer, minimum		ASTM D 2240
3.2.2.1	Type 1 - After curing at standard conditions for 48 hours	35	4.5.1
3.2.2.2	Type 2 - After curing at standard conditions for 72 hours	35	4.5.1
3.2.3	Nonvolatile Content, minimum	97% by weight	4.5.3
3.2.4	Tack-Free Time, maximum		4.5.4
3.2.4.1	Type 1	10 hours	
3.2.4.2	Type 2	24 hours	
3.2.5	Viscosity of Base Compound	6000 to 16000 Poises (600 to 1600 Pa.S)	4.5.5
3.2.6	Flow	0.1 to 0.75 inch (2.5 to 19.0 mm)	4.5.6
3.2.7	Application Time, minimum	15 grams/minute	4.5.7
3.2.8	Electrical Resistance, maximum	0.002 ohms	4.5.8
3.2.9	Weight Loss, maximum	8%	4.5.9
3.2.10	Flexibility, Room Temperature	No cracking when bent	4.5.9
3.2.11	Low-Temperature Flexibility	No visual evidence of cracking or checking.	4.5.10
3.2.12	Accelerated Storage Stability	14 Days at 120 °F (49 °C)	4.5.11
3.2.13	Long-Term Storage Stability	6 months at 77 °F (25 °C)	4.5.11
3.2.14	Soluble Chromate Content	3.0 to 7.0% by weight.	4.5.12
3.2.15	Tensile Strength, minimum	250 psi (1725 MPa)	4.5.13
3.2.16	Elongation, minimum	200%	4.5.13

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TABLE 1 - Properties (Continued)

Paragraph	Property	Reqirement	Test Method
3.2.17	Resistance to Salt Water and Hydrocarbons	No visual evidence of softening, blistering, or evidence of corrosion.	4.5.14
3.2.18	Hydrolytic Stability, Shore A Hardness, minimum	30	4.5.15
3.2.19	Corrosion Inhibition	No corrosion.	4.5.16
3.2.20	Resistance to Heat	No visual evidence of softening, sponging, blistering, checking, cracking, shrinkage, or powdering.	4.5.17
3.2.21	Heat Reversion Resistance	Compound shall not revert to a liquid or paste-like consistency, nor shall it become brittle or lose adhesion.	4.5.18
3.2.22	Shear Strengt	200 psi (1379 MPa)	4.5.19

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3.3 Appearance:

Compound, as received by purchaser, shall be uniform in quality and condition, as free from foreign materials as commercially practicable and free from imperfections detrimental to usage of the compound. There shall be no separation of ingredients that cannot be readily dispersed.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of compound shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the compound conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests for hardness (3.2.2), nonvolatile content (3.2.3), tack-free time (3.2.4), viscosity of base compound (3.2.5) except as specified in 4.2.1.1, flow (3.2.6), application time (3.2.7), and electrical resistance (3.2.8) are acceptance tests and shall be performed on each lot.

4.2.1.1 Viscosity of base compound need not be performed on compound packaged in sectionalized containers or in containers with less than 8 ounces (237 mL) of compound.

4.2.2 Qualification Tests: Tests for all technical requirements are qualification tests (See 8.2) and shall be performed prior to or on the initial shipment of compound to a purchaser, when a change in ingredients and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, contracting officer, or request for procurement.

4.3 Sampling and Testing:

Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient sealing compound shall be taken at random from each lot to perform all required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three. Multiple testing is not required for viscosity, application time, flow, tack-free time, hardness, and electrical resistance.

4.3.1.1 A lot shall be the quantity of formulated compound mixed as one production entity.

4.3.1.2 Compound for testing shall be mixed, as much as practical, in the same containers in which the compound was procured.

4.3.1.3 When a statistical sampling plan has been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report for 4.6 shall state that such plan was used.

4.3.2 For Qualification Tests: Samples shall consist of three 1 quart (1 liter) containers of compound.

4.3.2.1 For U.S. Government Procurement: Samples shall be identified as specified herein and forwarded to the activity responsible for qualification as designated in the letter of authorization from that activity (See 8.2). Samples for qualification shall be identified as follows:

SEALING COMPOUND, ELECTRICALLY CONDUCTIVE, CORROSION INHIBITING

Specification AMS 3377A
Manufacturers Number
Name of Manufacturer
Date of Manufacture
Batch Number
Submitted by (Name) (Date) for qualification test in accordance with
AMS 3377A under authorization (Reference Authorization Letter)

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4.4 Approval:

4.4.1 Sealing compound shall be approved by purchaser before sealing compound for production use is supplied, unless such approval be waived by purchaser. Results of tests on production sealing compound shall be essentially equivalent to those on the approved (qualified) sample.

4.4.1.1 For direct U.S. Military contracts, the sealing compound shall be listed, or approved for listing, on the applicable U.S. Military qualified products list.

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production compound which are essentially the same as those used on the approved (qualified) sample. If necessary to make any change in ingredients, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in ingredients and/or processing and, when requested, sample compound. Compound made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods:

Shall be in accordance with the following:

4.5.1 Test Conditions: Standard laboratory testing conditions shall be 77 °F ± 2 (25 °C ± 1) and 50% ± 5 relative humidity. Except as otherwise specified herein, all test specimens shall be prepared and cured under these conditions.

4.5.2 Preparation of Test Specimens:

4.5.2.1 Cleaning of Test Panels: All test panels shall be cleaned by scrubbing and rinsing using MIL-C-38736 solvent and clean AMS 3819 cloths.

4.5.2.2 Preparation of Sealing Compound: The quantity of sealing compound required for the test shall be thoroughly mixed according to manufacturer's instructions.

4.5.2.3 Application of Sealing Compound: Unless otherwise specified herein, the mixed sealing compound shall be uniformly applied to the test panels to produce a coating thickness, after cure, of 0.125 inch ± 0.032 (3.18 mm ± 0.81).

4.5.2.4 Cure of Sealing Compound: For qualification testing, the sealing compound shall be cured for 14 days at standard conditions. For acceptance testing, the sealing compound shall be given an accelerated cure for 48 hours ± 1 at standard conditions plus 24 hours ± 0.5 at 140 °F ± 2 (60 °C ± 1). Tests on cured sealing compound shall commence not more than 48 hours after the completion of the specified cure.

4.5.2.4.1 Standard heat cycle shall consist of the cure cycle of 4.5.2.4 followed by 60 hours ± 4 at 160 °F ± 2 (71 °C ± 1) and 6 hours ± 1 at 180 °F ± 2 (82 °C ± 1).

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4.5.3 Nonvolatile Content: Within five minutes after mixing or warming to application temperature, 12 grams ± 2 of mixed sealing compound shall be transferred as rapidly as possible to a previously weighed (W_1) aluminum dish approximately 3 inches (76 mm) in diameter. The sealing compound shall be extruded in a spiral from a plastic cartridge fitted with a 0.125 inch (3.18 mm) orifice nozzle, filling the bottom of the dish to a uniform depth. The initial weight (W_2) shall be determined using an analytical balance accurate to within ±1 milligram. Immediately following weighing, the sample and dish shall be placed in a circulating-air oven preheated to 160 °F ± 5 (71 °C ± 2), and allowed to dwell for 168 hours ± 2. Following dwell, the sample and dish shall be removed from the oven and allowed to cool to room temperature in a desiccator. Final weight (W_3) shall be determined on the same balance used for the initial weights. All weights shall be recorded to the nearest milligram.

4.5.3.1 Percent nonvolatile shall be determined from the average of three samples calculated as shown in Equation 1.

$$\text{Percent Nonvolatile} = \frac{W_3 - W_1}{W_2 - W_1} \times 100 \qquad \text{(Eq. 1)}$$

4.5.4 Tack-Free Time:

4.5.4.1 A 0.040 x 2.75 x 6 inch (1.02 x 69.8 x 152 mm) AMS 4049 aluminum alloy panel shall be cleaned in accordance with 4.5.2.1. Sealing compound, mixed and applied in accordance with this specification, shall cover the cleaned panel surface to a depth of 0.125 inch ± 0.032 (3.18 mm ± 0.81). The panel shall be set aside to cure at standard conditions (See 4.5.1).

4.5.4.2 At the end of the tack-free time (see 3.2.4), two 1 x 7 inch (25 x 178 mm) pieces of polyethylene 0.005 inch ± 0.002 (0.10 mm ± 0.05) thick shall be applied to the sealing compound and held in place at a pressure of approximately 1/32 psi (215 Pa) for two minutes.

4.5.4.3 The polyethylene strips shall be slowly and evenly peeled back at right angles to the sealing compound surface. The polyethylene shall come away clean and free of sealing compound.

4.5.5 Viscosity of Base Compound:

4.5.5.1 Shall be determined with the base compound placed in a 1 pint (1/2 liter) can. The can shall be filled with base compound to within 0.5 inch (13 mm) of the top, covered, and stored at 77 °F ± 2 (25 °C ± 1) for not less than eight hours. The base compound shall be thoroughly mixed by stirring slowly for not less than three minutes, the can closed, and the base compound allowed to stand for approximately one hour.

4.5.5.2 The Brookfield Model RVF viscosimeter, or equivalent, with No. 7 spindle at 2 rpm shall be used and the readings obtained converted to poises (Pa.S). The highest reading shall be taken after the instrument has run in the base compound for approximately one minute.

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4.5.6 Flow:

4.5.6.1 A standard sealant gun cartridge, fitted with a suitable nozzle, shall be filled with freshly mixed sealing compound. The gun and sealing compound shall be maintained at standard conditions throughout the test. The test shall be conducted with a flow-test jig as shown in Figure 1. Depth of plunger tolerance is critical and shall be controlled within the tolerance during all tests. The flow-test jig shall be placed on a table with the front face upward and the plunger depressed to the limit of its travel. Within 15 minutes after the beginning of mixing, enough of the mixed sealing compound shall be extruded from the application gun to fill the recessed cavity of the jig and leveled off even with the block. The test at this interval shall be considered the initial flow of the sealing compound. Within 10 seconds after the leveling operation, the jig shall be placed on its end and the plunger immediately advanced to the limit of its forward travel. The flow measurement shall be taken 30 minutes ± 2 after the sealing compound has been applied to the test jig. The flow shall be measured from tangent to the lower edge of the plunger to the farthest point to which flow has advanced. As the sealing compound progresses in its application time, the flow-test shall be repeated for Type 2 compound at 50 minutes ± 2 and 90 minutes ± 3 after mixing.

4.5.7 Application Time:

4.5.7.1 The base compound, curing compound, and application gun shall be stabilized at standard conditions for not less than eight hours before the base compound is mixed with the proper amount of curing compound. Not less than 250 grams of base compound shall be mixed with the proper amount of curing compound.

4.5.7.2 The mixed sealing compound shall be promptly used to fill a standard sealant cartridge, having a nozzle with an orifice diameter of 0.125 inch ± 0.005 (3.18 mm ± 0.13). The gun and sealing compound shall be maintained at standard conditions throughout the test.

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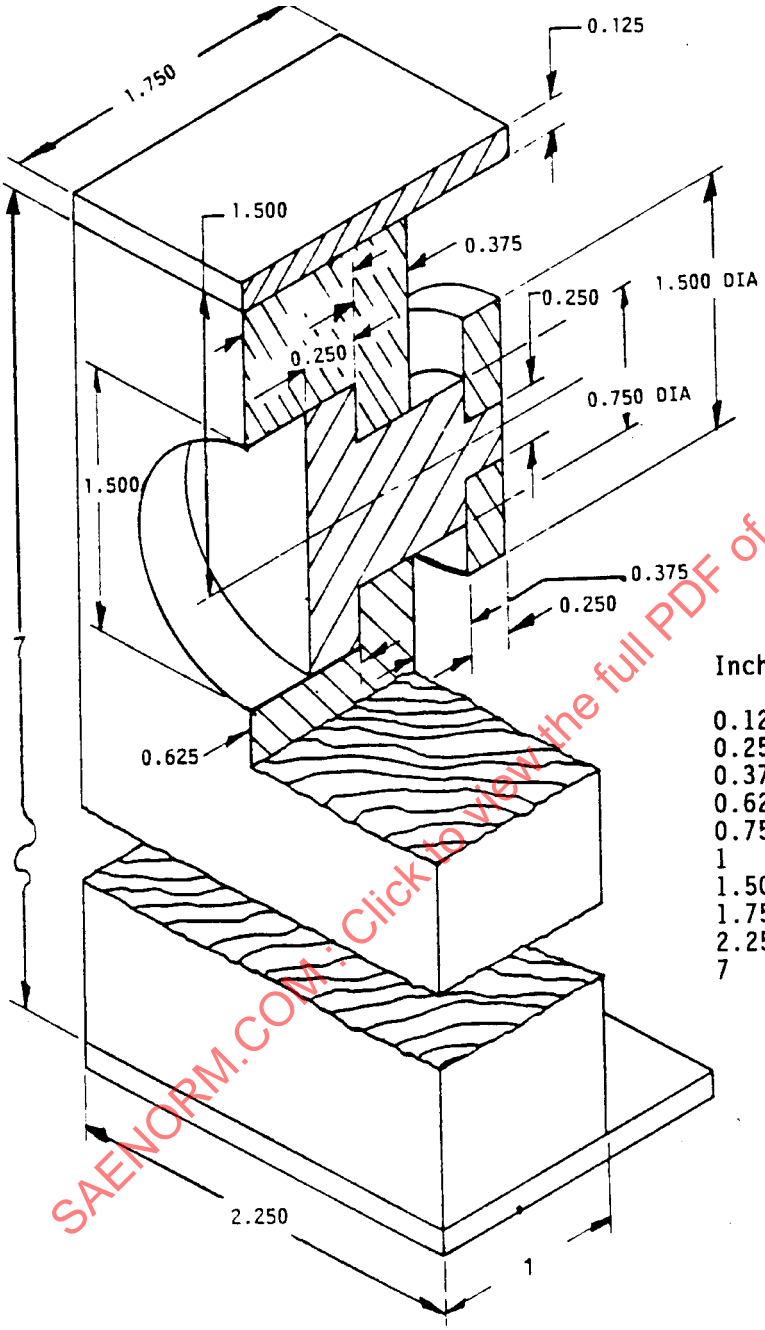

Inches	Millimeters
0.125	3.18
0.250	6.35
0.375	9.52
0.625	15.88
0.750	19.05
1	25
1.500	38.10
1.750	44.45
2.250	57.15
7	178

Material: Aluminum Alloy

Dimensions are in inches (millimeters)
Tolerances for the decimals are ±0.015 inch (0.38 mm).

FIGURE 1 - Flow Test Jig

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4.5.7.3 The gun shall be attached to a constant air supply of 90 psi ± 5 (621 kPa ± 34). From 2 to 3 inches (51 to 76 mm) of sealing compound shall be extruded initially to clear any entrapped air. At the end of the rated application time, measured from the beginning of the mixing period, the sealing compound shall be extruded onto a suitable receptacle for one minute and the amount of extruded sealing compound determined.

4.5.8 Electrical Resistance: Shall be determined as follows:

4.5.8.1 Two aluminum test panels shall be cleaned in accordance with 4.5.2.1 and deoxidized by immersion for 5 to 7 minutes in 20% by volume nitric acid, thoroughly rinsed with distilled water, and prepared as shown in Figure 2.

4.5.8.2 Apply sufficient sealing compound, approximately 0.010 inch (0.25 mm), to the mating surfaces of the test angles (See Figure 2) and immediately assemble the two angles using a 5/16 inch (7.9 mm) diameter bolt insulated from the angles with phenolic washers and vinyl sleeves. The bolt shall be tightened to a torque value of 80 inch-pounds ± 5 (9.0 N·m ± 0.6) and the sealant cured for 14 days under standard conditions as specified in 4.5.2.4.

4.5.8.3 On completion of cure, the electrical resistance of the cured sealant shall be determined by applying a 15-ampere current across the gap between electrodes located as shown in Figure 2. The voltage drop shall be measured and the resistance, in ohms, calculated using Equation 2.

$$\text{Resistance} = \frac{\text{Voltage Drop}}{15} \qquad \text{(Eq. 2)}$$

4.5.9 Weight Loss and Flexibility:

4.5.9.1 Four 0.125 x 1 x 5 inch (3.18 x 25 x 127 mm) specimens shall be cut from a sheet of the sealing compound that has been cured (See 4.5.2.4.) for 168 hours ± 2 at standard conditions.

4.5.9.2 The specimens shall be weighed and immersed in 900 mL of AMS 2629, Type 1, jet reference fluid for 168 hours ± 2 at 140 °F ± 2 (60 °C ± 1) in a closed container. At the end of the exposure period, the specimens shall be removed from the fluid and air dried for 72 hours ± 1 at 125 °F ± 2 (52 °C ± 1). The specimens shall be cooled to a standard test condition in a desiccator and weighed.

4.5.9.3 After weighing, the specimens shall be bent 180 degrees over a 0.125 inch (3.18 mm) mandrel and examined for evidence of cracking.

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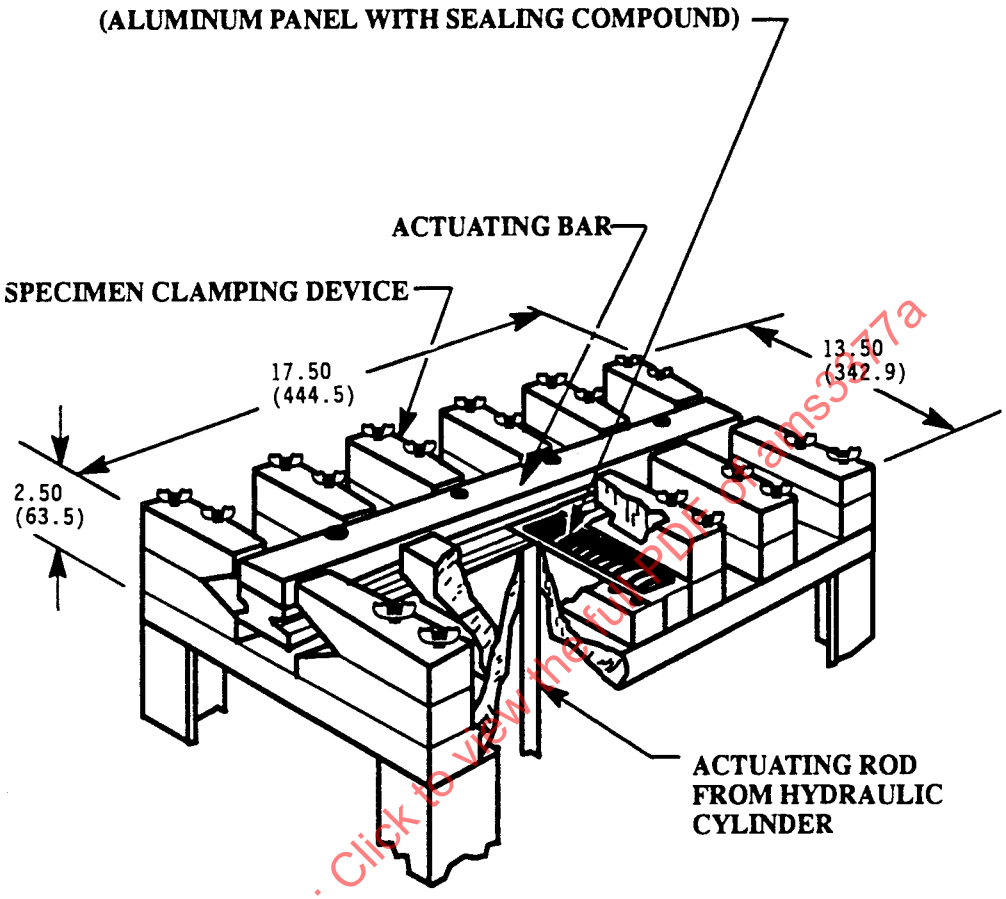

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All dimensions are in inches (millimeters), tolerances are ± 0.010 (± 0.25)
Material - Angle LS3395, 2024 -T4, or equal
(Both angles are dimensioned the same and matching).

FIGURE 2 - Test Specimen

4.5.10 Low-Temperature Flexibility:

4.5.10.1 Four test panels, nominally 0.040 x 2.75 x 6 inch (1.02 x 69.8 x 152 mm), shall be prepared from AMS 4049 aluminum alloy sheet. A coating of the sealing compound 0.100 inch ± 0.025 (2.54 mm ± 0.64) thick by 1.5 inches (38 mm) wide by 4 inches (102 mm) long shall be applied to the center of each of the four panels. At the end of a 14-day cure as in 4.5.2.4, two panels shall be conditioned at 200 °F ± 5 (93 °C ± 3) for an additional 168 hours ± 2. All four panels shall be placed in a low-temperature flexibility jig consisting of a clamp support that will grip both sides of both 6-inch (152-mm) edges of the panel, 3 inches (76 mm) from one end, without touching the sealant (See Figure 3). The jig shall be capable of flexing the panel through a 30-degree arc (15 degrees each side of center) at a constant speed of one cycle per five seconds. The temperature shall be reduced to -65 °F ± 2 (-54 °C ± 1), stabilized at this temperature for 2 hours ± 0.1, and the panels flexed through 130 consecutive cycles.

4.5.11 Storage Stability:

4.5.11.1 Accelerated Storage Stability: A full, tightly closed 1 quart (1 liter) container of the base compound and a full, tightly closed container of the appropriate amount of the curing compound shall be maintained 14 days ± 4 hours at 120 °F ± 2 (50 °C ± 1).

4.5.11.1.1 After cooling to standard conditions for 24 hours ± 0.5 (see 4.5.1) the viscosity of the base compound shall be determined. The sealing compound shall be mixed as specified herein and application time, tack-free time, hardness, and electrical resistance determined.

4.5.11.2 Long-Term Storage: A full, tightly closed 1 quart (1L) container of the base compound and a full, tightly-closed container of the appropriate amount of the curing compound shall be stored at 77 °F ± 2 (25 °C ± 1) for six months. If stored at -40 °F ± 2 (-40 °C ± 1) or less, the storage period may be extended to 1 year.

4.5.11.2.1 At the end of the storage period, the compound shall be tested as in 4.5.11.1.1.

4.5.12 Soluble Chromate Content: Shall be determined by the following procedure:

4.5.12.1 Sample Preparation: Not less than 25 grams of the sample, cured in accordance with 4.5.2.4, shall be filed off such that all of the sealant will pass an ASTM No. 40 sieve (0.165 inch (4.19 mm) screen size) or equivalent. A small portion shall be sifted. A 5-gram sample of filed material shall be placed into a 250 mL Erlenmeyer Flask and 100 mL of distilled water added. The sample shall be covered with a watchglass, placed on a hot plate, and boiled for 1 hour ± 0.1. After boiling for the time specified, the flask shall be removed from the heat and the liquid decanted into a 500 mL flask. The flask and sealant shall be rinsed with 5 to 10 mL of distilled water. This procedure shall be repeated until the last extraction is colorless.

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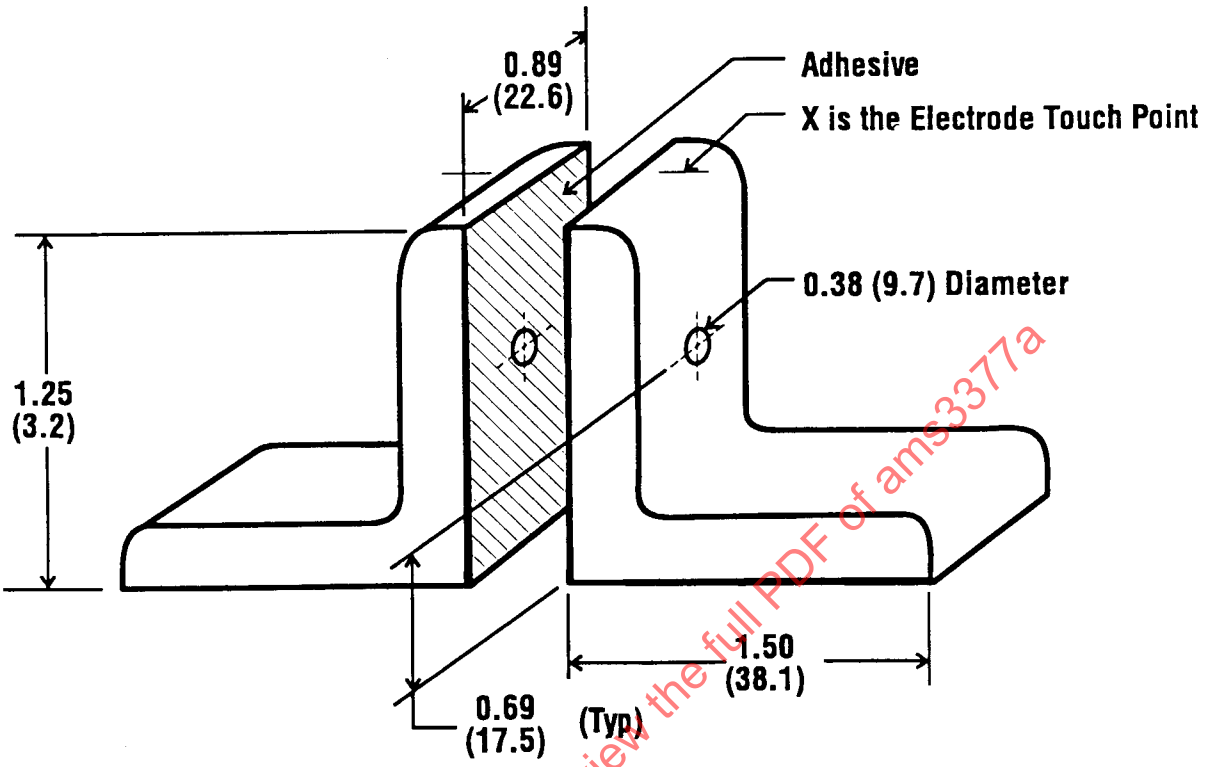

All dimensions are in inches (millimeters), tolerances are ±0.010 (±0.25)
Material - Angles LS3395, 2024 -T4, or equal
(Both angles are dimenioned the same and matching).

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DIMENSIONS IN INCHES (MILLIMETERS)

FIGURE 3 - Low-Temperature Flexibility Test Jig

4.5.12.2 Titration: After the filtrate collected in 4.5.12.1 has cooled to ambient temperature, 10 mL of concentrated hydrochloric acid and 2 grams of potassium iodide shall be added to the filtrate; the flask shall be covered immediately and allowed to stand for not less than five minutes. The solution shall be titrated with 0.1 N sodium thiosulfate until the brown color of iodide is almost gone; then add 2 mL of freshly prepared starch solution. The titration shall be continued until the dark blue color of iodine-starch solution is gone. Do not mistake the green color of the Cr^{+3} ion for the blue color of the iodine-starch complex. The volume in milliliters of sodium thiosulfate required for titration shall be recorded.

4.5.12.3 Calculation: The percentage of soluble chromate shall be calculated as magnesium chromate pentahydrate using Equation 3.

$$\frac{(m1 \cdot Na_2S_2O_3) \times (N\ Na_2S_2O_3) \times (0.0768) \times 100}{\text{Weight of sample in grams}} = \%MgCrO_4 \cdot 5H_2O) \qquad \text{(Eq. 3)}$$

(Results shall be reported to the nearest whole number.)

4.5.13 Tensile Strength and Elongation:

4.5.13.1 Mixed sealing compound, 0.125 inch ± 0.015 (3.18 mm ± 0.38) thick, shall be prepared by pressing between two polyethylene sheets, removing the top sheet at the end of the rated tack-free time, and allowing the sealing compound to cure at standard conditions in accordance with 4.5.1. The cured sealant shall have a minimum Shore A hardness of 35 prior to test. Three tensile specimens shall be cut from the sheet after not less than a 14-day cure, using die C, as specified in ASTM D 412.

4.5.13.2 The tensile and elongation tests shall be conducted at standard conditions in accordance with ASTM D 412 at a jaw separation rate of 2 inches per minute (0.8 mm/s).

4.5.14 Resistance to Salt Water and Hydrocarbons:

4.5.14.1 A 0.040 x 2.75 x 6 inch (1.02 x 69.8 x 152 mm) AMS 4037 aluminum alloy panel shall be cleaned in accordance with 4.5.2.1. Sealing compound shall cover the cleaned panel surface to a depth of 0.125 inch ± 0.032 (3.18 mm ± 0.81).

4.5.14.2 At the end of the sealing compound cure (see 4.5.2.4), the panel shall be immersed vertically in a covered glass vessel so that one-third of the sealing compound is exposed to an aqueous solution containing 3% by weight sodium chloride, one-third is exposed to AMS 2629, Type I, jet reference fluid, and one-third is exposed to the vapor of the AMS 2629, Type I, jet reference fluid.

4.5.14.3 Immersion shall be for 168 hours ± 2 at 140 °F ± 2 (60 °C ± 1).

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4.5.15 Hydrolytic Stability: A cured specimen, approximately 0.5 inch (13 mm) thick x 3 inches (76 mm) in diameter shall be exposed for 120 day ± 4 hours in an environment of 160 °F ± 2 (71 °C ± 1) and 95% ± 5 relative humidity. At the expiration of this period, the specimen shall be held for 160 hours ± 2 at standard conditions and the instantaneous hardness shall be determined in accordance with ASTM D 2240.

4.5.16 Corrosion Inhibition:

4.5.16.1 Three AMS 4049 aluminum alloy test panels, nominally 0.10 x 1 x 3 inch (2.5 x 25 x 76 mm), shall be cleaned in accordance with 4.5.2.1. The panels shall be deoxidized by immersion for 5 to 7 minutes in 20% by volume nitric acid and thoroughly rinsed with distilled water.

4.5.16.2 A NAS603-8P fastener and a MS21042-3 nut shall be installed approximately 0.5 inch (13 mm) from one end of the test panels.

4.5.16.3 A 0.004 to 0.008 inch (0.10 to 0.20 mm) sheet of sealing compound shall be precast between two pieces of polyethylene film. The test sealing compound shall be cured in accordance with 4.5.2.4.

4.5.16.4 Three 0.05 gram ± 0.01 specimens shall be cut from the cured sealing compound sheet. Each specimen shall be immersed in a wide mouth four ounce (118 mL) jar containing 50 mL of 3.5% by weight solution of sodium cloride in distilled water. One test panel shall be placed in each jar such that the fastener is immersed. The jar shall be capped and stored for 30 days at standard conditions (See 4.5.1).

4.5.17 Resistance to Heat:

4.5.17.1 A 0.040 x 2.75 x 6 inch (1.02 x 69.8 x 152 mm) AMS 4049 aluminum alloy panel shall be cleaned in accordance with 4.5.2.1.

4.5.17.2 Sealing compound shall cover one side of the cleaned panel surface to a depth of 0.125 inch ± 0.032 (3.18 mm ± 0.81). At the end of the sealing compound cure (see 4.5.2.4), the panel shall be immersed vertically for 48 hours ± 1 at 140 °F ± 2 (60 °C ± 1) in AMS 2629, Type I, jet reference fluid in a closed container with one-half of the sealing compound above the liquid level.

4.5.17.3 The panel shall be removed, air dried for 24 hours ± 1 at standard conditions and baked for 24 hours ± 1 at 200 °F ± 5 (93 °C ± 3).

4.5.18 Heat Reversion Resistance: Two AMS 4049 aluminum alloy panels, nominally 0.040 x 3 x 12 inches (1.02 x 76 x 305 mm), anodized in accordance with AMS 2471 shall be coated with freshly-mixed sealing compound applied over one surface of one panel and the other panel positioned over the sealant-covered surface to form a sandwich with a layer of sealing compound approximately 0.010 inch (0.25 mm) thick. The panels shall be given a standard cure as in 4.5.2.4, exposed for 8 hours ± 0.25 at 200 °F ± 5 (93 °C ± 3), cooled to room temperature, peeled apart, and inspected for conformance to 3.2.21.

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